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10/699,846	11/04/2003	Motoki Kakui	50395-236	4038

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McDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER
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HUGHES, DEANDRA M

ART UNIT	PAPER NUMBER
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3663

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06/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/699,846

**Applicant(s)**

KAKUI, MOTOKI

**Examiner**

Deandra M. Hughes

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 11 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

1. The amendment filed 05/17/07 has been entered.

### *Response to Arguments*

2. Applicant's arguments filed 5/17/07 have been fully considered but they are not persuasive. Applicant argues the following.

- (A) "Applicants submit this amendment, together with the new arguments submitted below are a proper submission under 37 C.F.R. § 1.114 and place the application in condition for allowance. In the event, the Examiner rejects one or more of the pending claims, a final rejection on a first action would be premature and improper." (pg. 6, 2<sup>nd</sup> paragraph; original emphasis).
- (B) "...DCF 114 cannot be considered as a nonlinear medium, as required in claim 1. The nonlinear medium required in claim 1 is a part of a Raman amplification pump module and signal light does not propagate through the nonlinear medium." (pg. 7, lines 9-11).
- (C) "At page 3 of the Office Action, the Examiner asserted that element 130 corresponds to the multiwavelength light source of claim 4." (pg. 8, 2<sup>nd</sup> paragraph).
- (D) "Claims 9 was rejected under the first paragraph of 35 U.S.C. § 112 for lack of adequate support." (pgs. 8-14).

Argument (A) is unpersuasive because 37 C.F.R. § 1.114 makes no statement as whether new arguments would render a final rejection on the first action premature or improper. The cited rule merely states, "A submission as used in this section includes, but is not limited to, an information disclosure statement, an amendment to the written description, claims, or drawings, new arguments, or new evidence in support of patentability." (emphasis added). The rule makes no statement as to the propriety of a final rejection in response to new arguments.

Since all claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application, a final rejection is warranted. See MPEP § 706.07(b).

Argument (B) is unpersuasive because the Examiner considers fig. 1 to be the pump module. Please note line 5 under section 4 of the previous office action (dated 1/17/07) wherein the Examiner states, "DiGiovanni discloses a Raman amplification pump module (fig. 1)..."

Argument (C) is unpersuasive because the Examiner never asserted that the multiwavelength source corresponds to DiGiovanni's element 130. Contrary to Applicant's assertion, pg. 3 of the previous office action (dated 1/17/07) explicitly states, "With regard to claim 4, #130 oscillates and tunes pump signals to different wavelengths." One of ordinary skill in the art understands that gratings, which are reflectors, are capable of oscillating light at different wavelengths. This coupled with a light source, i.e. the pumps (note 130 is Fiber Bragg Grating for pumps), results in the oscillations at two more different wavelengths.

Argument (D) is convincing. Consequently, the USC 112 rejection is withdrawn.

***Claim Rejections - 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 3-4, 6-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni (US 6,504,973 filed 3/16/02) in view of Akasaka (US 6,292,288 published 9/18/01).

With regard to claims 1 and 11, DiGiovanni discloses a Raman amplification pump module (fig. 1) for outputting pump light for Raman-amplification of signal light propagating through an optical waveguide path, said module comprising:

- a light source system for emitting light having two or more different output peak wavelengths (#116);
- a nonlinear medium having an input port and an output port (#114; col. 6, lines 10-15);
- said light source system comprises two or more light sources for emitting light having different wavelengths (col. 5, lines 30-35);
- said nonlinear medium affording nonlinear effect on light (#114 is a HNLF) emitted from said light source system and input from the input port, and outputting the resultant light as pump light from the output port (counter-pumps #116 are reflected to co-propagate to the output via #130).

DiGiovanni discloses a coupler #118 to couple the counter-propagating pump signal. However, DiGiovanni does not specifically disclose that the coupler is a WDM coupler. WDM couplers are well-known in the art. Further, Akasaka teaches a WDM coupler (fig. 1; #113) which multiplexes multiple pumps of different wavelengths in a counter-propagating configuration for a Raman amplifier. It would have been obvious to one of ordinary skill in the art (e.g. an optical engineer) at the time the invention was made for

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the advantage of counter-propagating the pump signal, as is specifically taught by Akasaka (fig. 1).

With regard to claim 3, DiGiovanni does not disclose a temperature adjusting means for the light sources.

With regard to claim 4, #130 oscillates and tunes pump signals to different wavelengths.

With regard to claim 6, the wavelength spacing is more than 2nm (fig. 8, #1 to #4).

With regard to claim 7, the Examiner considers the language directed toward the discretionary selection of the output wavelengths to be functional language. See below.

With regard to claim 8, HNLF is a Highly Nonlinear Fiber.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni in view of Akasaka as applied to claim 1 above, and further in view of Bolshtyansky (US 6,456,426 published Sep. 24, 2002).

With regard to claim 2, DiGiovanni in view of Akasaka does not disclose a high-output power laser. However, Bolshtyansky teaches a Raman amplifier with a high-output power laser pump (col. 6, lines 60-65). It would have been obvious to one of ordinary skill in the art (e.g. an optical engineer) at the time the invention was made to use a high-output power laser for the advantage of increased amplification.

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure *rather than function alone*. Since the structural limitations have been met by

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the prior art, the Examiner has reason to believe that the function limitation, i.e., the structure *as claimed* is capable of causing optical parametric effect. See MPEP 2114.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni in view of Akasaka as applied to claim 1 above, in view of Tsuzaki (Broadband Discrete Fiber Raman Amplifier with High Differential Gain Operating Over 1.65 $\mu$ m-band, 2000).

DiGiovanni in view of Akasaka does not specifically disclose the claimed figure of merit (FOM). However, Tsuzaki teaches that a Raman amplifier with a highly-nonlinear-fiber (HNLF) with a FOM 13.2 W<sup>-1</sup>dB<sup>-1</sup> (pg. MA3-2, line 16). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to apply the HNLF of Tsuzaki to the device of DiGiovanni in view of Akasaka for the advantage of a high-gain, low-noise Raman amplifier, as is specifically taught by Tsuzaki.

#### ***Allowable Subject Matter***

7. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

8. This is a RCE of applicant's earlier Application No. 10/699,846. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL**

even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Deandra M. Hughes  
Primary Examiner  
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